



# Vegetable Crop Update

A newsletter for commercial potato and vegetable growers prepared by the University of Wisconsin-Madison vegetable research and extension specialists

No. 3 – June 2, 2024

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- Colorado Potato Beetle, Potato Leafhopper, Seedcorn Maggot updates
- 2024 Commercial Vegetable Production in Wisconsin Guide (A3422)
- Potato and veg disease forecasting in 2024 update
- *Phytophthora nicotianae* blight vs late blight

## Calendar of Events:

**July 11, 2024** – UW Agricultural Research Station Potato Field Day, Hancock, WI

**July 18, 2024** – UW Langlade County Extension & WI Seed Potato Certification Program – Ag Research Station Field Day, Antigo, WI

**July 31, 2024** – UW-Madison Rhinelander Agricultural Research Station Potato Breeding Farm Field Day, Rhinelander, WI (contact Becky Eddy)

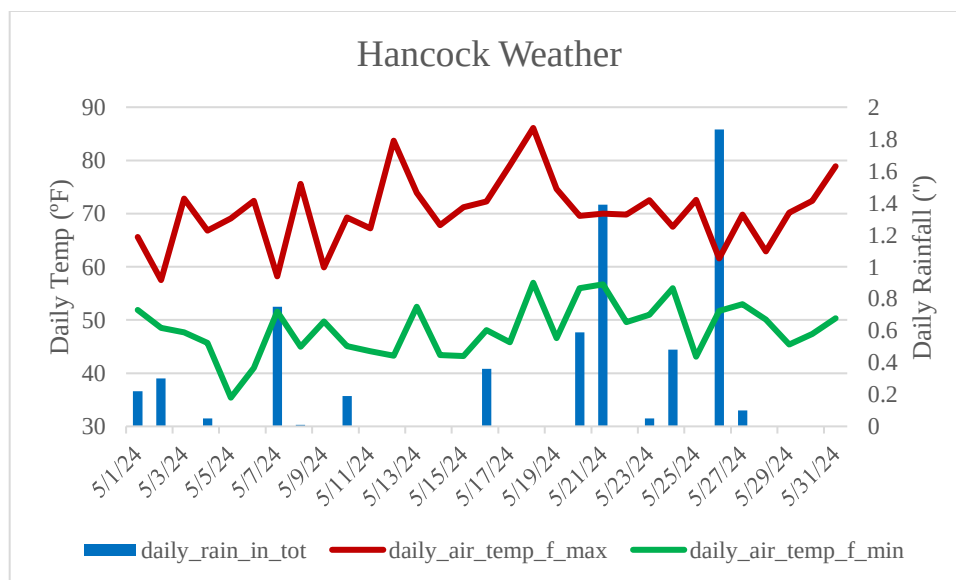
**December 3-5, 2024** – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center

**January 13-14, 2025** – Wisconsin Agribusiness Classic, Alliant Energy Center, Madison, WI

**February 4-6, 2025** – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

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We planted our seed tubers for the variety trial on April 30<sup>th</sup>. So far, the growing season has been going well with no extreme weather conditions. The rainfall during the week of May 21<sup>st</sup> resulted in wet soil conditions that might impact crop emergence or early growth. We checked on our crop emergence rate on May 29<sup>th</sup>: Russet Burbank showed 100% emergence, Portage Russet showed 50%, the yellow fresh variety Constance had 70%, and the European yellow French fry varieties showed 80% emergence.



This year we will launch some new precision agriculture techniques to conduct our research at Hancock:

1. We will use a dock system that automatically charges a drone to collect daily RGB and thermal images, we will then use machine learning algorithms to predict crop N status and final yield. Based on the predicted values, we will generate recommended N application amount at different crop growth stages;
2. We will implement a digital dog to assist us with field scouting for potatoes and snap beans. I published a YouTube video about the dog (named “the big puppie”): [https://youtu.be/6UOneEswf84?si=dZ\\_V9z1qmFao9f6O](https://youtu.be/6UOneEswf84?si=dZ_V9z1qmFao9f6O);
3. We are trying to use data fusion algorithms to combine radio files and imaging data together for developing N fertilization decision support models. For the radio data, my student will record voice files talking to a smart phone about the weather, the field and the crop during each field scouting (instead of writing on notebooks or entering on tablets). Our goal is to develop a ChatGPT-like platform that could be easily used by our farmers to guide N applications or other input (irrigation, pesticide) applications.

We will demonstrate the dock and the digital dog at the Hancock Ag Research Station during the field day on July 11<sup>th</sup>. Stay tuned.

**Vegetable Insect Update – Russell L. Groves, Professor and Department Chair, UW-Madison, Department of Entomology, 608-262-3229 (office), (608) 698-2434 (cell), e-mail [rgroves@wisc.edu](mailto:rgroves@wisc.edu)**

**Vegetable Entomology Webpage:** <https://vegento.russell.wisc.edu/>

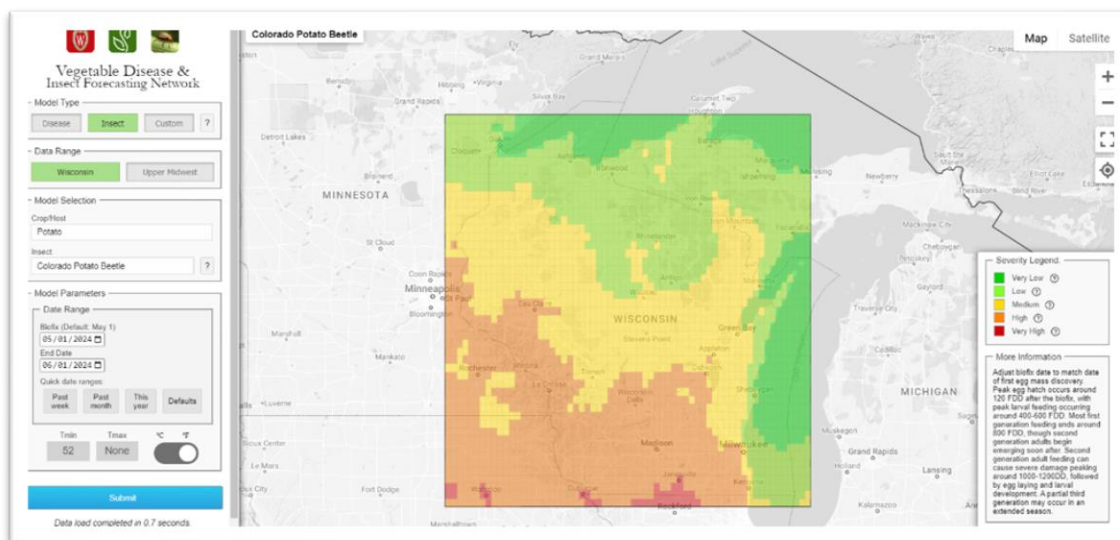
**Colorado potato beetle (CPB)** – (<https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/>). Check for the beginning of CPB egg hatch and early larval development in portions of southern Wisconsin. Potato fields in southern and central Wisconsin in mid-April are reaching canopy closure and emerging adults have colonized many fields. In areas near Stevens Point and into northern Wisconsin, adult colonization is just underway and beginnings of egg laying is underway. In these areas where egg laying is just occurring in outside borders of the field it is critical to deploy perimeter sprays at this time. Focus early season scouting on border rows that are adjacent to last year’s potato. These have the greatest probability for early infestation by adult CPB and egg masses.

Table 1. Rate of beetle development using degree days  
See **VDIFN** (base: 52°F; max: none; biofix: 1st eggs)

| Life stage    | Degree days | Accumulated degree days | Treatment                                              |
|---------------|-------------|-------------------------|--------------------------------------------------------|
| Egg           | 120         | 120                     | Not susceptible – do not treat                         |
| First instar  | 65          | 185                     | Most effective time to apply Btt                       |
| Second instar | 55          | 240                     | Most effective time to apply conventional insecticides |
| Third instar  | 60          | 300                     | Most effective time to apply conventional insecticides |
| Fourth instar | 100         | 400                     | Most effective time to apply conventional insecticides |
| Pupae         | 275         | 675                     | Not susceptible – do not treat                         |

It is critical to follow the development stages of insects within fields to understand the best application times. Current insecticides often control only select stages of insect development, so it is critical to know when egg hatching is underway and early instar larvae are appearing in fields. Remember that insect development is directly related to temperature: cool weather slows growth, warm weather accelerates development.

Using a degree-day based, temperature dependent system incorporating daily high and low temperatures instead of calendar dates will help to anticipate pest outbreaks. Begin tracking temperatures when you find the first egg mass (or use an online degree-day calculator like the [Vegetable Disease and Insect](#)



[Forecasting Network](#)). The VDIFN site maintains a running total of degree days to chart insect development and provides a visual map illustrating risk. The number of degree days needed for each stage of Colorado potato beetle development is provided (see inset). First generation emergence (and subsequent risk) is illustrated across central and southern Wisconsin in the yellow and orange colors for the appearance of early instar larvae. (Source: <https://agweather.cals.wisc.edu/vdifn>).

**Potato leafhopper (PLH).** To date in Wisconsin the arrival and presence of potato leafhopper adults have been low. Leafhoppers and other migratory insects could move into the state in the coming week with recent passage of major weather systems. It is important to stage vigilant

and scout fields for the presence of adults now that we have reached the first of June. Recall that leafhopper feeding can result in stunted plants, brown leaves and reduced plant vigor. Both adults and nymphs feed by inserting their mouth parts into the plant's vascular tissue and extracting sap. Damage results when the insect injects saliva containing toxic substances and creates physical damage during feeding, plugging the vascular tissue and permanently reducing the plant's photosynthetic efficiency.

| When to scout for potato leafhopper |       |     |      |       |     |      |       |     |      |       |     |      |        |     |      |           |     |      |
|-------------------------------------|-------|-----|------|-------|-----|------|-------|-----|------|-------|-----|------|--------|-----|------|-----------|-----|------|
|                                     | April |     |      | May   |     |      | June  |     |      | July  |     |      | August |     |      | September |     |      |
|                                     | early | mid | late | early | mid | late | early | mid | late | Early | Mid | Late | Early  | Mid | Late | Early     | Mid | Late |
| Potatoes                            |       |     |      |       |     |      |       |     |      |       |     |      |        |     |      |           |     |      |
| Beans                               |       |     |      |       |     |      |       |     |      |       |     |      |        |     |      |           |     |      |

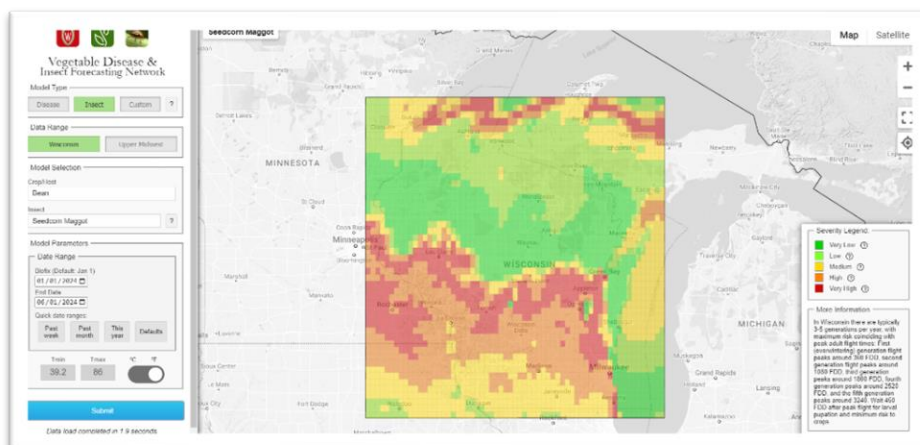
Action threshold levels for vegetables

| Crop                | Nymphs              | Adults               |
|---------------------|---------------------|----------------------|
| Seedling snap beans | 1 every 10 leaves   | 1 adult per 2 sweeps |
| Larger snap beans   | 1 every 10 leaves   | 1 adult per sweep    |
| Potatoes            | 2 ½ every 25 leaves | ¾-1 adult per sweep  |

**Seedcorn maggot ‘Second generation emergence across Wisconsin and upper Midwest –** (<https://vegento.russell.wisc.edu/pests/seedcorn-maggot/>). The second generation of the seedcorn maggot

has entered southern Wisconsin and is progressing northward. Recall that seedcorn maggots (SCM) have a large host range including numerous common vegetable crops. In high numbers and when peak SCM are predicted, egg laying and larval development can decimate entire crop stands if left untreated.

Peak flight activity for 2<sup>nd</sup> generation of seedcorn maggot in the upper Midwest and across southern Wisconsin. The risk of infestation from the developing 2<sup>nd</sup> generation is illustrated by the warm colors (reds, oranges, yellows) on the map. (Source: <https://agweather.cals.wisc.edu/vdifn/>).



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Please note that we have our **2024 Commercial Vegetable Production in Wisconsin Guide (A3422)** available at the link below as a free searchable, downloadable pdf. This provides information to help you select inputs to support healthy vegetable and specialty crop production in Wisconsin.

<https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin>

**Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations will be posted at our website and available in the weekly newsletters.** Thanks to Ben Bradford, UW-Madison Entomology for supporting this effort and providing a summary reference table: <https://agweather.cals.wisc.edu/thermal-models/potato>. A Potato Physiological Day or P-Day value of  $\geq 300$  indicates the threshold for early blight risk and triggers preventative fungicide application. A Disease Severity Value or DSV of  $\geq 18$  indicates the threshold for late blight risk and triggers preventative fungicide application. Data from the modeling source: <https://agweather.cals.wisc.edu/vdifn> are used to generate these risk values in the table below. I've estimated early, mid-, and late planting dates by region based on communications with stakeholders. These are intended to help in determining optimum times for preventative fungicide applications to limit early and late blight in Wisconsin.

|              | Planting Date |        | 50%<br>Emergence<br>Date | Disease Severity Values<br>(DSVs)<br><br><i>through 6/1/2024</i> | Potato Physiological Days<br>(P-Days)<br><br><i>through 6/1/2024</i> |
|--------------|---------------|--------|--------------------------|------------------------------------------------------------------|----------------------------------------------------------------------|
| Spring Green | Early         | Apr 3  | May 9                    | 6                                                                | 173                                                                  |
|              | Mid           | Apr 17 | May 12                   | 6                                                                | 156                                                                  |
|              | Late          | May 10 | May 25                   | 1                                                                | 54                                                                   |
| Arlington    | Early         | Apr 5  | May 10                   | 2                                                                | 164                                                                  |
|              | Mid           | Apr 20 | May 15                   | 2                                                                | 133                                                                  |
|              | Late          | May 12 | May 25                   | 0                                                                | 54                                                                   |
| Grand Marsh  | Early         | Apr 5  | May 10                   | 7                                                                | 154                                                                  |
|              | Mid           | Apr 20 | May 15                   | 7                                                                | 125                                                                  |
|              | Late          | May 12 | May 25                   | 0                                                                | 52                                                                   |
| Hancock      | Early         | Apr 10 | May 17                   | 7                                                                | 110                                                                  |
|              | Mid           | Apr 22 | May 21                   | 5                                                                | 80                                                                   |
|              | Late          | May 14 | June 2                   | TBD                                                              | TBD                                                                  |
| Plover       | Early         | Apr 14 | May 18                   | 7                                                                | 104                                                                  |
|              | Mid           | Apr 24 | May 22                   | 2                                                                | 72                                                                   |
|              | Late          | May 19 | TBD                      | TBD                                                              | TBD                                                                  |
| Antigo       | Early         | May 1  | May 24                   | 0                                                                | 49                                                                   |
|              | Mid           | May 15 | June 1                   | TBD                                                              | TBD                                                                  |
|              | Late          | June 1 | TBD                      | TBD                                                              | TBD                                                                  |
| Rhineland    | Early         | May 7  | May 25                   | 0                                                                | 46                                                                   |
|              | Mid           | May 18 | TBD                      | TBD                                                              | TBD                                                                  |
|              | Late          | June 2 | TBD                      | TBD                                                              | TBD                                                                  |

**Late blight of potato/tomato.** The usablight.org website (<https://usablight.org/map/>) indicates no reports of late blight in potato or tomato from the US so far in 2024. The site is not comprehensive. We accumulated few to no Blitecast Disease Severity Values over the past week.

**Early blight of potato.** P-Day values will continue to amass (up to ~10 per day) and develop conditions optimum for early blight disease caused by *Alternaria solani*. Earliest inoculum comes from within field (small crop residue fragments can harbor the pathogen) and from nearby fields. Once established, early blight continues to create new infections due to its polycyclic nature – meaning spores create foliar infection and the resulting lesion on the plant can then produce new spores for ongoing new infections in the field and beyond. Early season management of early blight in potato can mitigate the disease for the rest of the growing season.

For custom values, please explore the UW Vegetable Disease and Insect Forecasting Network tool for P-Days and DSVs across the state (<https://agweather.cals.wisc.edu/vdifn>). This tool utilizes NOAA weather data. In using this tool, be sure to enter your model selections and parameters, then hit the blue submit button at the bottom of the parameter boxes. Once thresholds are met for risk of early blight and/or late blight, fungicides are recommended for optimum disease control. Fungicide details can be found in the 2024 Commercial Veg. Production in WI Extension Document A3422:

<https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin>

**Late blight ‘look-alike’ noted in central Wisconsin potato.** While *Phytophthora nicotianae*, a cousin to the late blight pathogen *Phytophthora infestans*, is typically a soilborne pathogen infecting roots and tubers (can cause ‘pink rot’), lesions can sometimes form on the foliage of tomato and potato (its host range includes citrus, tobacco and ornamentals). The presence of this ‘*nicotianae* blight’ indicates leaf wetness and higher temperatures and the lesions are often seen in potatoes along the irrigation pivot tracks. *Phytophthora nicotianae* can form overwintering soilborne structures known as oospores and chlamydospores. **Foliar infections look menacingly like late blight, but the lesions do not exhibit sporulation (pictures below).** It’s important to be aware of this disease and to have it diagnosed to confirm the underlying pathogen. Late blight is typically favored under cooler temperatures than *P. nicotianae* and does sporulate profusely, making spread much more challenging to control. Foliar fungicide programs which protect against late blight can also control ‘*nicotianae* blight’. More information can be found in a nice web article by Dr. Jean Ristaino, Amanda Saville, Inga Meadows, and Mary Lorscheider from North Carolina State University at: <https://plantpathology.ces.ncsu.edu/2018/06/phytophthora-nicotianae-causing-severe-disease-on-potato-and-tomato-in-north-carolina/>



*Phytophthora nicotianae*, a pathogen that produces similar symptoms to late blight (*P. infestans*) in potato.



Underside of potato leaf infected by *P. nicotianae*